

PUMP ASSEMBLY WITH ONE PIECE PISTON

Abstract

An assembly including a pump attachment particularly adapted to form an nonaerosol pump sprayer, and a method of using the same. The apparatus desirably includes an attachment having a pump sprayer which is pressurized on the upstroke enabling the sprayer to be shipped and stored in a relaxed position. The attachment includes a body, a coupling, a shaft, a piston, an inlet valve and a biasing member. The body defines an elongate chamber having the first end, second end, and an interior wall extending between the first end and second end. The coupler is sized and shaped to secure the body to the neck of a container. The shaft extends through the opening in the first end of the chamber and defines an internal flow channel. The piston is reciprocally mounted within the chamber and includes an inner annular surface surrounding the shaft and an outer annular surface sized and shaped to form a sealing engagement with the interior wall of the body. The attachment defines a sealing surface substantially fixed with respect to the piston and a second sealing surface substantially fixed with respect to the shaft. The first sealing surface and the second sealing surface having the first position wherein the first sealing surface and the second sealing surface cooperate to prevent the flow of liquid between the piston and the shaft. The first sealing surface and the second sealing surface also has a second position wherein the first sealing surface and the second sealing surface permit the flow of liquid between the piston and the shaft. The piston is formed from a single piece said piston and defines an inner annular surface surrounding the shaft and an upper outer annular surface sized and shaped to form a sealing engagement with said interior wall of the body and a lower outer annular surface sized and shaped to form a sealing engagement with the interior wall of said body.